

SYSTEM AND METHOD OF CONTROLLING POWER CONSUMPTION IN AN ELECTRONIC SYSTEM

Abstract

A method and apparatus for adaptively adjusting the operating voltage of an integrated circuit in response to tester-to-system variations, worst-case testing techniques, process variations, temperature variations, or reliability wearout mechanisms. The minimum operating voltage of an integrated circuit is determined either during external testing of the integrated circuit or during built-in-self-testing. The minimum operating voltage is transmitted to a variable voltage regulator where it is used to set the output of the regulator. The output of the regulator supplies the integrated circuit with its operating voltage. This technique enables tailoring of the operating voltage of integrated circuits on a part-by-part basis which results in power consumption optimization by adapting operating voltage in response to tester-to-system variations, worst-case testing techniques, process variations, temperature variations or reliability wearout mechanisms. Alternatively, the invention enables adaptive adjustment of the operating fre-

quency of an integrated circuit. The invention enables system designers to adaptively optimize either system performance or power consumption on a part-by-part basis in response to tester-to-system variations, worst-case testing techniques, process variations, temperature variations or reliability wearout mechanisms.